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Research on crowding in prisons is reviewed. Studies have shown that crowding in prisons can increase blood pressure, palmar sweat, illness complaints, and aggression. The number of people per housing unit appears to be more important than space per person. Tolerance for crowding was found to decrease with the experience of crowding. Research on crowding in other settings was related to the research on crowding in prisons. (Author)

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Abstract

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Research on crowding in prisons is reviewed. Studies have shown that crowding in prisons can increase blood pressure, palmar sweat, illness complaints, and aggression. The number of people per housing unit appears to be more important than space per person. Tolerance for crowding was found to decrease with the experience of crowding. Research on crowding in other settings was related to the research on crowding in prisons.

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Effects of Crowding in Prisons

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At present there is a great deal of concern about crowding in prisons. One encounters countless references in the news media to the overcrowded conditions in jails and prisons. In fact, the federal government is now working actively to have county jails and state prisons meet minimum housing standards. Yet is there a basis for all this concern? Does it really matter if one lives under crowded conditions? Sure, one might feel a little uncomfortable, but presumably one would soon adapt. People often live in crowded cities, countries and housing without complaining. Furthermore, since a disproportionately large number of inmates are from a lower class background, one could argue that these inmates might have an above average tolerance for crowding. They presumably tend to come from large families, crowded homes, and crowded parts of cities.

On the other hand, some of the figures on housing in prisons are indeed a little startling. For example, a recent congressional report on federal prisons (Federal Prison Construction: Alternative Approaches, 1977) indicated that 48% of the inmates in the federal prisons have less than 45 sq. ft. of space per inmate and only 18% have more than 65 sq. ft. In the three big maximum security prisons (Atlanta, Leavenworth, and McNeil Island) 80% of the inmates have less than 45 sq. ft. of space and only 7% have more than 65 sq. ft. Professional standards for new prisons are 70 - 80 sq. ft.

County and state institutions often have even less space per inmate than federal institutions. In the Texas State Prison at Huntsville, up to four

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inmates live in 45 sq. ft. cells. In Dallas County Jail up to 70 inmates may be in one living unit with about 10 or 11 sq. ft. per inmate.. Yet is the amount of space per inmate (spatial density) really that important or is the number of fellow inmates one has to contend with in a housing unit (social density) more important? Prison and government officials and designers have focused primarily on space per person while ignoring the possible importance of social density.

Until a few years ago, very little factual information was available to help one decide whether to be concerned about crowding (social or spatial) or whether one can simply ignore it. For the past six years we have been trying to determine what the psychological effects of crowding in prisons really are and to what extent social or spatial density are important in producing such effects.

With the aid of grant support from the Hogg Foundation we spent several months visiting a number of federal and state prison sites and local jails to determine the feasibility of conducting crowding research in these environments (Paulus, McCain, & Cox, 1973). We were particularly interested in finding accessible facilities where architectural features provided a wide range of cell and dormitory sizes and population levels which would provide substantial variation in the two basic components of crowding, social density and spatial density. We wanted to minimize the need for cross-institutional comparisons so that all our subjects would be exposed to the same administrative milieu. Of the eleven institutions visited we found two which met our criteria, Texarkana Federal Correctional Institution (TFCI) and Dallas County Jail (DCJ). Data we have collected from these facilities, over several years, have

convinced us that prolonged exposure to high social density can produce a variety of effects that are not revealed in data collected from laboratory studies and statistical surveys.

At TFCI housing ranged from one man units to 46 man dormitories. The residents are of course there involuntarily and have little control over their housing assignment. Although the inmates are not confined to their housing unit at all times they must be there from ten p.m. until seven a.m. and at several times during the day for roll call. There is a high turnover among inmates within various housing units. Dallas County Jail, at the time of our visits, involved much more intense crowding. The units ranged from one man cells to 70 man dorms. Spatial density during our visits ranged from 10 to 174 square feet per man. Unlike the prison setting, inmates were confined to their cells twenty-four hours a day. High turnover and indeterminancy of stay are also characteristic of this jail. To put these crowding figures in perspective it should be realized that 350 square feet of living space per person is considered desirable in American homes (Altman, 1975, p. 177). A 1000 square foot house or apartment would have to have approximately 50 residents to approximate the spatial and social density frequently experienced at this facility at the time of our visits.

Thus, prisons appear to provide intensely crowded conditions. The inescapability of the crowding in prisons and the lack of control over housing assignment by the inmates may also be important factors. Work by Glass and Singer (1972) and Sherrod (1974) suggests that to the extent that an individual can escape or control his exposure to stressors such as noise and crowding, the effects of the stressor may be attenuated.

Our first studies focused on the effects of social and spatial density on an individual's criterion of overcrowding (Paulus, Cox, McCain, & Chandler, 1975). We employed a variation of a task devised by Desor (1972). Inmates at TFCI were asked to place human figurines in a model room until it appeared overcrowded. While the task is simple it yielded results systematically related to a subject's housing conditions and specifically the social density component of crowding. Increases in social density, but not spatial density, was also related to increased negative affect among the inmates. Further, our results indicated that tolerance for crowding in high social density conditions declined as a function of length of time in such conditions, whereas no relationship was found for single cell housing. Tolerance of crowding was also inversely related to negative evaluation of physical environs.

These results suggest that social crowding in prisons can produce negative emotional responses and a lessened tolerance for crowding. The fact that tolerance for crowding in high social density decreased over time is counter to notions that man can easily adapt to crowded situations but consistent with recent models which suggest that overcrowding will lead to increased valuation of low levels of crowding (Altman, 1975; Stokols, 1972).

Our subsequent studies have investigated the possibility that high social density as encountered in prisons and jails would generate indications of psychological stress. We chose two measures that were feasible to employ in prison and jail environs and have been interpreted as expressions of psychological stress in other contexts. These were illness complaint rates (McCain, Cox, & Paulus, 1976) and palmar sweat (Cox, Paulus, McCain, & Schkade, 1977). Hinkle (1961) and more recently Kiritz and Moos (1974) have argued that illnesses are

encouraged by psychological stress generated by social environments. Physiological mechanisms by which such effects might be mediated have recently been elaborated by Stein, Schiani, Camerino, (1976). Illness complaint rates have been shown to be systematically related to crowding in naval vessels (Dean, Pugh, & Gunderson, 1975) and college dormitories (Jacobs, Spilken, & Norman, 1969). In our investigations of the relationship between crowding and illness complaints we excluded complaints of flu and colds, though even these illnesses are not facilitated by crowding-induced contagion to the degree many assume (Dean et al., 1975). The most frequent complaints in our sample were backache, nausea, rash, sinus, constipation, chest pain, and asthma. We found that in both TFCI and DCJ illness complaint rates were greater in more crowded conditions. These results are consistent with those recently reported by Dean et al., (1975) for naval vessels. Illness complaint rate has been shown to be determined, in part, by psychological stress and this suggests at least one important deleterious effect that may vary a function of degree of crowding.

Recently we have examined the possibility that another expression of social stress, palmar sweat, may vary with crowding (Cox et al., 1977). This relatively simple measure has been employed as an index of arousal (cf. Dabbs, Johnson, & Levanthal, 1968) and has been shown to vary with social stress generated by audiences and group competition in laboratory studies (Cohen and Davis, 1973; Martens, 1969). An additional feature of this study was that we were able to examine the differential contributions of both spatial and social density to this index of stress. This was not possible in the two previous studies of physiological consequences of crowding induced stress in prisons (McCain et al., 1976; D'Atri, 1975).

Palmar sweat prints were obtained from 46 inmate volunteers at the Texarkana Federal Correctional Institution. The palmar sweat scores derived from these prints (see Dabbs et al., 1968 for details) were examined for correlation with the inmate's social density and spatial density. A significant positive correlation of palmar sweating with social density was obtained ($r = .33$). The relationship between spatial density and palmar sweating was negligible ($r = .06$). Since inmates in units of low social density were found to have been in the prison longer, the social density effect could have been a function of the length of time in prison instead of the type of housing unit. However, the correlation of total days in prison for an inmate and the degree of palmar sweating was not significant ($r = .08$). These results suggest that high levels of crowding in prisons can increase physiological expressions of stress. These results are also consistent with D'Atri's (1975) finding that crowding in prisons can affect another physiological measure, blood pressure. Our findings suggest that D'Atri's results were probably mediated by social density but not spatial density.

A number of other studies have investigated the effects of crowding in prisons on aggression. Megargee (1977) found that inmates in more crowded dorms had higher infraction rates. However, since the crowding was accomplished by combining the population of two different dorms, the results may simply reflect the problems produced by assimulating two different social groups. Another study (Nacci, Teitelbaum, & Prather, 1977) compared the assault rates among inmates at 36 federal prisons. Prisons which were overcrowded had higher assault rates than those which were less crowded. These findings could be attributed to other possible features of overcrowded prisons

such as having a larger proportion of young (more assault prone) inmates and more stringent reporting procedures. One of us is presently investigating with Robert Matthews whether crowding is related to the occurrence of disciplinary infractions at the Fort Worth and Texarkana FCI's. At Fort Worth we are looking at the infraction rate of one unit as it became more crowded over the span of five years. At Texarkana we are investigating whether social density within the various housing units is related to increased infraction rates.

A large number of studies have recently investigated the effect of crowding in other settings such as college dorms, (e.g., Aiello & Epstein, 1977; Baron, Mandel, Adams, & Griffin, 1976; Valins and Baum, 1973), naval vessels (Dean et al, 1975), housing projects (McCarthy & Saegert, 1977), a train station (Saegert, McKintosh & West, 1975) and stores (Langer & Saegert, 1976; Saegert et al., 1975). While these settings in most cases involve moderate degrees of crowding that do not approach conditions in prisons, they have yielded results that indicate that moderate levels of crowding can also have negative psychological effects. For example, it has been found that crowding produces negative affect and social withdrawal in dorms and housing projects (Aiello & Epstein, 1977; Baron et al., 1976; McCarthy & Saegert, 1977; Valins & Baum, 1973), increased illness complaints on naval ships (Dean et al., 1975), and disruption of cognitive functioning in stores and train stations (Langer & Saegert, 1976; Saegert et al., 1975).

These studies have thus generally supported the findings of our prison research. In fact, some studies have also found social density to be more important than spatial density. (Eoyang, 1974; Schettino, & Borden, 1976)

and that the experience of crowding reduces tolerance for crowding (Baron et al., 1976; Valins & Baum, 1973). Further studies will be required to determine whether crowding in prisons also leads to the social withdrawal, lack of perceived control, feeling of social overload, and disturbance of cognitive functioning found in other settings (e.g., Langer & Saegert, 1976; McCarthy & Saegert, 1977; Rodin, 1976). The findings of sex differences in response to crowding are also worthy of further study in a prison setting. Laboratory studies have generally found that males react more negatively to being crowded than females (e.g., Freedman, Levy, Buchanan, & Price, 1972; Ross, Layton, Erickson, & Schopler, 1973). However, one dormitory study (Aiello & Epstein, 1977) found that females were less able to function in crowded dorm rooms than males.

CONCLUSIONS

Research has thus shown that crowding (in particular social density) in prisons can be stressful and lead to increased negative affect, physiological arousal, illness complaints, aggression, and a lowered tolerance for crowding. Other studies suggest that prison crowding may also lead to social withdrawal, feelings of social overload, lack of perceived control, and disturbance of cognitive functioning. However, the present data do not allow us to make very specific predictions about the level of stress produced by particular prison environments. Although we have shown that dorms of 26 or more men significantly increase stress levels over units of 1 or 2 men, it is possible that small dorms of 6 to 10 men may not be very stressful. Some evidence for this was found in our palmer sweat data in that units of 7 to 8 men were not different from units of 1 to 2 men. Small dorms might be even

more desirable than single man cells in prisons where inmates are confined to their cells most of the day. Too much isolation or privacy may be as stressful as too little (e.g., Altman, 1975). Of course, an important consideration may be the type of inmate population. If one is likely to encounter violent or sexually abusive inmates, private cells may be preferred, even if one is confined all day. Another factor in favor of 1 or 2 man cells is man's desire to have territorial control over certain areas. Especially since inmates have lost most of their rights and freedoms, "ownership" of a piece of private territory may have great psychological importance. (I am indebted to Bob Heisse of FCI, Fort Worth for pointing out the importance of this factor.)

The effects of visual contact with inmates in other cells also needs to be investigated. In many prisons inmates are confined in cells but have visual access to inmates in cells across the hall. Certain theorists have argued that simple visual exposure to others can lead to feeling of being crowded (e.g., Desor, 1972). Also, some prisons such as Texarkana have corridors in which inmates are housed in single or double man units. The number of units in these hallways range from 9 to 32. Even though the potential privacy for these inmates is greater than for those in dorms, inmates in hallways with 32 units may experience more crowding-related stress than those in hallways with less units because of the higher anumber of potential interactions in the larger units. Inmates with private or double rooms cannot lock their doors when they are inside. Hence, they are subject to unwanted intrusions by other inmates. Finally, all research on crowding in prisons has been done with males. Some research suggests that females may

even be more susceptible to the negative effects of crowding than males (e.g., Aiello & Epstein, 1977). Certainly more research is required to further examine sex differences, and the effect of other variables discussed. Only when we have this additional information will we be able to make intelligent decisions about prison design.

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